

4 – Sensor Gradiometer

GSM-19TGW4

Our Supplier GEM Systems is the number one global leader in the manufacture and sale of high precision magnetometers.

GEM is the only commercial manufacturer of Overhauser magnetometers that are accepted and used at magnetic Observatories over the world.

GEM's Proton sensors are considered the most practical and robust magnetometers for general field use.

GEM's Potassium Magnetometers are the most precise magnetometers in the world.

Proven reliability based on GEM's 35 years of R&D

Integrated systems with GPS and additional survey capability with VLF-EM are available as options for convenience and high productivity

GEM is creating the absolute best in airborne sensors and are leading the way in super sens ally designed for highly sensitive studies with super large sensors for research of Natural Hazards globally and now smaller and lighter sensors for practical UAV applications.

GEM Leadership and Success in the World of Magnetics is your key to success in applications from Archaeology, Volcanology and UXO detection to Exploration and Magnetic observation Globally.



Multi-sensor configurations can be implemented on various platforms. These platforms take advantage of GEM's 4-channel "true simultaneous" capabilities

The GSM-19T magnetometer is the heart of GEM's unique 4 Sensor gradient magnetometer -- representing a unique blend of data quality, operational efficiency, system design and options that clearly differentiate it from other magnetometers. With data quality of standard proton precession magnetometers, the GSM-19T has applications in many fields, including:

- Mineral exploration (ground and airborne base station)
- Environmental and engineering
- Pipeline mapping
- Unexploded Ordnance Detection
- Archeology
- Magnetic observatory measurements
- Volcanology and earthquake prediction

The GSM-19T magnetometers also deliver high absolute accuracy and rapid cycling (up to 2 readings / second).

These advantages, combined with the use of 4 precisely timed, highly accurate sensors, provides a measuring system that is without comparison in the industry.

The GSM-19T Proton Precession features highly-effective proton polarization, three data acquisition modes (Mobile, Gradient, Base Station and walking); has a large-volume on-board memory; and comes with an optional high-resolution (0.7 m) integrated GPS.

This GEM GSM-19T provides excellent sensitivity for many applications in most environments. (.15nT @ 1 reading per sec).



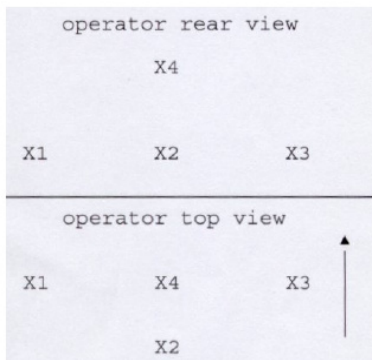
GSM-19T Proton Magnetometer
The Proton Magnetometer from GEM provides a reliable, robust affordable survey solution.

Configurations

Key components that differentiate the GSM-19TGW4 from other systems on the market include the sensor and data acquisition console. Specifications for components are provided on the right side of this page. In addition, the GSM-19TGW4 can be configured in one of two arrays: 3D and Planar.

3D Configuration

With the 3D configuration, sensors are arranged in a “wedge-type” array with a leading (or trailing) sensor that is on a different elevation than the other sensors. The following diagram shows this configuration



Sensor X4 is located at a different level than the other sensors in order to derive the 3D vertical gradient. Output values are determined automatically using the GEM system console.

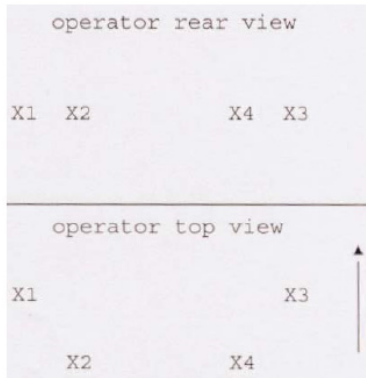
The image of the cart-borne system shows a simple 2 sensor array in operation.



Note that an external GPS can also be provided for highly accurate positioning of the survey results.

Planar Configuration

With the planar configuration, sensors are arranged in-line as shown in the following diagram.



From a physical perspective, the sensor is a small size, light-weight assembly that houses the detection system and fluid. A rugged plastic housing protects the internal components during operation and transport.

All sensor components are designed from carefully screened non-magnetic materials to assist in maximization of signal-to-noise.

Heading errors are also minimized by ensuring that there are no magnetic inclusions or other defects that could result in variable readings for different orientations of the sensor.

Specifications

Performance

Sensitivity: 0.15 nT @ 1 reading per sec.
 0.05 nT @ 1 reading every 4 sec.
 Resolution: 0.01 nT
 Absolute Accuracy: +/- 0.2 nT @ 1 Hz
 Dynamic Range: 20,000 to 120,000 nT
 Gradient Tolerance: over 7000 nT/m
 Samples at: 60+, 5, 4, 3, 2, 1, 0.5 sec
 Operating Temperature: -40°C to +50°C

Operating Modes

Manual: coordinates, time, date and reading stored automatically (GSM-19T: 3s, 19TW: 0.5s, 19TGW: 0.5s)

Base Station: time, date and reading stored at 3(or 0.5) to 60 second intervals

Remote Control: optional remote control using RS-232 interface

Input/Output: RS-232 using 6-pin weatherproof connector with USB adapter.

Memory - 32 MB (# of Readings in millions)

Mobile: 1.4M, Base Station: 5.3M
 Gradiometer: 1.2M, Walking Mag: 2.6M

Dimensions & Weights

Console: 223 x 69 x 240 mm (8x3x9.5 in)
 Console: 2.1 kg (4.6 lbs)
 Sensor and Staff Assembly: 2.2 kg (4.8 lbs)

Standard Components

GSM-19T console, GEMLink+ software, battery, harness, charger, sensor with cable, RS-232 cable and USB adapter, staff, instruction manual and shipping case.

Options

Gradient Magnetometer, Walking Mode, VLF, GPS

Standard GPS Option : 0.6m SBAS (WAAS, EGNOS, MSAS)

High resolution GPS Option : 4cm

Novatel (plus TerraStar-C subscription)

VLF Option : Frequency Range: 15 to 30.0 kHz. with up to 3 stations. Parameters: Vertical in-phase and out-of-phase components as % of total field. 2 relative components of the horizontal field.
 Resolution: 0.1% of total field for VLF fields of 5pT or stronger.

The GSM 19T, 19TG, 19TW and 19TGW systems come complete with an industry leading three year warranty